REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-13, 17 and 18 are pending in the application of which claims 10-12 are under active examination. Applicant notes that claims 14-16 were canceled in the Preliminary Amendment filed February 13, 2004.

Claims 10 and 11 have been amended in order to more particularly point out and distinctly claim that which Applicant regards as their invention. Claim 10 is amended to characterize the solution into which the polyol/solvent solution is dissolved as containing a *hydrophobic* wall-component polymer. Basis for this terminology is found in the specification in the paragraph bridging pages 12 and 13, in particular, page 12, line 13.

Claim 11 is amended to further characterize and quantify the "low" molecular weight and "high" molecular weight polyols. The low molecular weight is specified to be 1000 g/mol or less and is disclosed in the specification at page 11, lines 6-17, in particular line 10. The high molecular weight polyol is one whose molecular weight is more than 1000 g/mol. This is based upon the description in the paragraph bridging pages 11 and 12 of the specification, in particular line 4.

Basis for the amendments made to claims 10 and 11 is as indicated above. No subject matter has been added.

In items 5-8 of the Official Action, claim 10 is rejected as being unpatentable over the combination of two references, both U.S. patents. This rejection is traversed.

Claim 10 relates to a method for preparing a polyol/polymer microcapsule containing at least one active component, the method including the steps of: 1) dissolving at least one active component selected from oil- water-soluble active components in a polyol/solvent solution; 2) dispersing the solution of step 1) in a polymer solution containing a hydrophobic wall-

component polymer; then 3) emulsifying the dispersed solution to collect an emulsion; and 4) removing polyol and solvent from the emulsion to collect hard polymer microcapsules.

U.S. Patent No. 4,898,781 to Fukushima discloses a process for preparing microcapsules by dissolving a polymeric wall material in a solvent with a core substance, adding a vehicle (polyhydric alcohol or polyol), emulsifying the dispersion and obtaining microcapsules, evaporating the solvent, washing off the polyhydric alcohols, and obtaining hard polymer microcapsules.

When compared to the present invention, Fukushima does not disclose the step of dissolving an active component in a polysol/solvent solution, then adding to that solution to a polymer solution – this is acknowledged in the Action.

In addition, Fukushima discloses that the core substance is limited to water-soluble materials. However, in the present invention, both an oil- and/or water-soluble active component can be used. When unstable active components are stabilized using a polymer microcapsule, generally an oil-soluble component is collected in a hydrophobic polymer and a water-soluble component is collected in a hydrophilic polymer. It is difficult to collect an oil-soluble and a water-soluble component in a polymer at the same time. However, the microcapsules according to the present invention can stably collect both an oil-soluble and a water-soluble component through a simple manufacturing process using a polyol when preparing the inventive microcapsules (*see* page 7, last full paragraph of the specification).

Furthermore, the polymer in Onouchi is water-soluble, thus a cross-linking process is needed to prepare microcapsules. In the present invention, however, the wall-component polymer is hydrophobic (*see* page12, line 12 through page 13, line 6 of the specification), thus cross-linking is not needed.

In the final sentence of item 8 of the Official Action, the Examiner argues that the specification does not provide any new or unexpected results due to the order of completion of the process steps. However, this observation does not take into account the unique nature of the materials used in the process coupled with the sequence of steps involved.

For the above reasons, it is respectfully submitted that claim 10 defines patentable subject matter. Reconsideration and withdrawal of this rejection is requested.

Claims 11 and 12 have attracted a separate rejection in items 9-12 of the Official Action based upon the two references discussed above further in view of U.S. Patent No. 3,664,963 to Pasin. This rejection is traversed as the subject matter of Applicants' claims, as above amended, is neither described in or suggested by a combination of the three applied references.

According to the present invention, an enzyme is dispersed into a low molecular weight polyol. Generally, an enzyme has partial solubility in a low molecular weight polyol. In this case, an enzyme forms spherical dispersoids with relatively high wettability in a low molecular weight polyol and only the external layer of the enzyme partially dissolves therein to form enzyme/polyol mixture phase dispersed solution.

The enzyme/polyol dispersed solution is then re-dispersed into a polymer solution, which comprises a high molecular weight polyol, a wall-component polymer (wall material) and a solvent. The enzyme phase protected with a low molecular weight polyol through the above process can stably disperse without being affected by solvent in the polymer solution. The high molecular weight polyol acts as a buffer that prevents direct contact between the enzyme and the hydrophobic polymer wall material in the microcapsule.

After that, the solvent is selectively removed from the resulting solution of enzyme/polyol/polymer/solvent. By removing the solvent, phase separation occurs because the

polyol is immiscible in the polymer. During this separation, the aqueous low molecular weight polyol flows out to the outer aqueous phase through the external interface of the microcapsule, due to its high polarity, and the high molecular weight polyol remains in the microcapsule. Accordingly, the microcapsule is composed of triple layers in which the enzyme forms the internal nuclei, hydrophobic high molecular weight polyol surrounds the enzyme, and finally the wall-component polymer forms the outer wall.

To maintain the characteristics of the enzyme and to block fundamentally undesirable contact with external stimulation, the microcapsules according to the present invention use a low molecular weight polyol as the template for forming the internal vesicle of the microcapsule and as the dispersion media of the enzyme. A high molecular weight polyol issued as the hydrophobic dispersing agent for the enzyme and as a blocking agent to prevent the enzyme from being denatured by the polymer of the internal wall material, which is totally different from conventional simple microcapsule, and can maintain stability of the enzyme during the formulation process and provides a long storage time (*see* pages 9-11 of the specification).

For the above reasons, it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and the allowance of claims 10-12 is solicited.

If the examiner requires further information please contact the undersigned.

The Examiner is authorized to cancel the non-elected claims upon allowance of claims 10-12.

Respectfully submitted,

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